



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/397,850

09/17/1999

ARLIN R. DAVIS

219.37206X00

9295

23838 7590 03/10/2006

KENYON & KENYON LLP
1500 K STREET N.W.
SUITE 700
WASHINGTON, DC 20005

EXAMINER

BURGESS, BARBARA N

ART UNIT

PAPER NUMBER

2157

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/397,850

Applicant(s)

DAVIS, ARLIN R.

Examiner

Barbara N. Burgess

Art Unit

2157

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-24 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This is in response to Applicant's amendment filed November 21, 2005. Claims 1-24 are presented for further examination.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 9-10, and 17-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Talluri et al. (hereinafter "Tall", 5,884,313).

As per claims 1, 9, and 17, Tall discloses a method, network device, and tangible medium storing a plurality of program instructions comprising:

- Sending a message from a local device to a remote device, via a network, said message including a transport header indicating a message type (column 2, lines 53-55, column 3, lines 62-67, column 4, lines 1-8);
- Determining, at the remote device, whether the transport header of said message identifies the message as a remote Direct Memory Access read operation (column 3, lines 49-53, column 5, lines 10-20, column 6, lines 41-47, 56-65);

Art Unit: 2157

- Performing a remote Direct Memory Access write operation at the local device in accordance to data elements included in said message, if the transport header of said message identifies the message as said remote Direct Memory Access read operation (column 5, lines 24-31, column 7, lines 22-30).

As per claims 2, 10, and 18, Tall further discloses a method, network device, and tangible medium storing a plurality of program instructions of claims 1, 9, and 17 wherein:

- Data elements in said rDMA read message identify a set of source buffers in the remote device which reference the remote host-side memory and a set of destination buffers in the local device that reference the local memory (column 5, lines 10-16, column 6, lines 40-55).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-4, 11-12, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Talluri et al. (hereinafter "Tall", 5,884,313) in view of Osborne.

As per claims 3, 11, and 19, the teachings of Tall does not explicitly disclose a method, network device, and tangible medium storing a plurality of program instructions of claims 2, 10, and 18 wherein the source and destination buffers being registered with a Virtual Interface network interface controller of the remote and local device.

However, the teachings of Osborne disclose receiving a virtual address from a controller in the network interface and determining the physical address based on the virtual address (column 1, lines 65-67, column 2, lines 29-31, column 8, lines 16-20, 48-50, 52-54). Therefore, Osborne implicitly discloses source and destination buffers being registered with the Virtual Interface network interface controller.

One of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate a Virtual Interface network interface controller in Tall's method to ensure appropriate data transfer protection and reduce the interaction of the operating system, which in turn conserves host processing cycles enabling an increase in the number of cycles available to application programs while decreasing the overall time it takes to receive messages.

As per claims 4, 12, and 20, Osborne further discloses a method, network device, and tangible medium storing a plurality of program instructions of claims 3, 11, and 19, wherein the data elements of the rDMA read message specifying the source buffers and destination buffers as multiple data segments with offsets and designating a channel of the Virtual Interface (VI) as a data path for the rDMA write operation (column

Art Unit: 2157

7, lines 7-9, column 8, lines 37-39, column 9, lines 44-55, column 11, lines 12-15, 36-37, column 13, lines 30-32, column 22, lines 48-49).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate the use of data segments with offsets and a channel of the Virtual Interface as the data path in Tall's method to ensure appropriate data transfer protection and reduce the interaction of the operating system, which in turn conserves host processing cycles enabling an increase in the number of cycles available to application programs while decreasing the overall time it takes to receive messages.

5. Claims 5-6, 13-14, and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Talluri et al. (hereinafter "Tall", 5,884,313) in view of Osborne and in further view of Krishnan et al. (hereinafter "Krishnan", 4,922,416).

As per claims 5, 13, and 21, the combined teachings of Tall and Osborne does not explicitly disclose a method, network device, and tangible medium storing a plurality of program instructions of claims 4, 12, and 20, wherein a data element of the rDMA read message specifying a last data segment and completion of the rDMA read request.

However, in an analogous art, Krishnan discloses an end of message signal that indicates the completion of a process or data transfer (column 1, lines 31-33, 42-46, column 4, lines 48-50, 53-55, column 5, lines 36-38, column 7, lines 8-10, column 8,

lines 10-12). Therefore, Krishnan implicitly discloses a data element of the rDMA read message specifying a last data segment and completion of the rDMA read request.

One of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate a data element specifying the completion of a rDMA read request in Tall's method in order for a data process or transfer to be completed quickly and efficiently by enabling other read/write requests to be executed.

As per claim 6, 14, and 22, the teachings of Tall does not explicitly disclose a method, network device, and tangible medium storing a plurality of program instructions of claims 5, 13, and 21, wherein the data is read directly from the remote memory of the remote device into the local memory of the local device over a Virtual Interface (VI) without making an intermediate copy. However, this feature is evidenced in the teachings of Osborne (column 1, lines 40-42, 67, column 2, lines 1, 22-25, 42-45, 55-61).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate reading data directly from the remote memory into the local memory in Tall's method in order to conserve host processing cycles, increase the number of cycles available to application programs, and decrease the delay in receiving messages.

6. Claims 7-8, 15-16, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Talluri et al. (hereinafter "Tall", 5,884,313) in view of Osborne and in

Art Unit: 2157

further view of Krishnan et al. (hereinafter "Krishnan", 4,922,416) and in further view of Chow et al (hereinafter "Chow", 6,052,387).

As per claims 7, 15, and 23, the combined teaching of Tall, Osborne, and Krishnan does not explicitly disclose write descriptors with a sequence inserted into the immediate data field on the last segment of each request.

However, in an analogous art, Chow discloses a last buffer bit, one field of the buffer descriptor, that indicates that the buffer descriptor is the last one of the linked list and thus the end of the data (column 4, lines 26-27, 38-40, 44-46, column 6, lines 39-41, column 8, lines 56-60, column 8, lines 12-16, column 9, lines 19-21, 25-26, 29-30). Therefore, Chow implicitly discloses write descriptors with a sequence inserted into the immediate data field on the last segment of each request.

One of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate the use of descriptors with the sequence inserted into the immediate data field on the last segment of each request in Tall's method in order to determine the end of a data to be read or written thereby decreasing the time it takes to read or write data and reducing the delay in data transfer.

As per claims 8, 16, and 24, the combined teachings of Tall and Osborne does not explicitly disclose the completion of data transfer is based on the immediate data that arrives with the last data segments of each write operation.

However, in an analogous art, Chow discloses a last buffer bit, one field of the buffer descriptor, that indicates that the buffer descriptor is the last one of the linked list and thus the end of the data process (column 4, lines 26-27, 38-40, 44-46, column 6, lines 39-41, column 8, lines 56-60, column 8, lines 12-16, column 9, lines 19-21, 25-26, 29-30). Therefore, Chow implicitly discloses the completion of data transfer is based on the immediate data that arrives with the last data segments of each write operation.

One of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate completion of the data transfer is based on the immediate data that arrives with the last data segments of each write operation in Tall's method in order to determine the end of the written or read data thereby decreasing the time it takes to read or write data and reducing the delay in data transfer.

Response to Arguments

The Office notes the following arguments:

- (a) Claims 1, 2, 9, 10, 17, 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Lundberg. It is noted that Lundberg was issued and published more than one year prior to the filing date of the present application.
- (b) There is nothing in the disclosure of Talluri that identifies the request message as an rDMA read operation.

In response to:

(a) It is noted that claims 1, 2, 9, 10, 17, and 18 are NOT rejected under 35 U.S.C. 102(e) as being anticipated by Lundberg. However, these claims stand rejected under 35 U.S.C. 102(e) as being anticipated by Talluri et al. (hereinafter "Tall", 5,884,313).

(b) Talluri discloses the process of node B (client) to read information from a disk (memory) at node A (server). Node B will be performing many disk reads from Node A. A request message is transmitted by the client (Node B) to the server (Node A) at which the requested information is stored. Upon receiving the request, the server sets up to have data written and transmitted to the requesting node. Talluri explicitly discloses the server receiving a remote data read request and the server performing a DMA operation. Talluri further references that a remote write operation can be performed in the same manner except for a minor change of the request message now indicates the write operation to be performed instead of the read operation. Therefore, Talluri indeed identifies the request as a rDMA read operation (column 3, lines 45-65, column 4, lines 9-11, 35-40, column 5, lines 1-13, 15-20, column 8, lines 5-8, 35-45, column 9, lines 26-31).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

Art Unit: 2157

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara N. Burgess whose telephone number is (571) 272-3996. The examiner can normally be reached on M-F (8:00am-4:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Ettinene can be reached on (703) 308-7562. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Barbara N Burgess
Examiner
Art Unit 2157

March 4, 2006


ARIO ETIENNE
PRIMARY EXAMINER